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# *Indian Standard*

# SPECIFICATION FOR STEEL BINS FOR DOMESTIC STORAGE

## PART I *GHARELU KOTHI*

UDC 631·563 : 624·953

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( *Continued on page* 10 )

# *Indian Standard*
# SPECIFICATION FOR STEEL BINS FOR DOMESTIC STORAGE

## PART I *GHARELU KOTHI*

## 0. FOREWORD

**0.1** This Indian Standard ( Part I ) was adopted by the Indian Standards Institution on 10 December 1973, after the draft finalized by the Storage and Marketing Structures for Agricultural Commodities Sectional Committee had been approved by the Agricultural and Food Products Division Council.

**0.2** Bins made of galvanized steel are gaining popularity for storage of foodgrains. Small bins with capacity up to 2 $m^3$ are generally preferred for such storage, since these bins can be kept indoors. With a view to helping the manufacturers to fabricate bins of required quality and performance and helping the farmers in getting proper type of bins, this standard has been formulated.

**0.3** The recommendations contained in this standard are based on the survey carried out and designs developed by the Indian Grain Storage Institute, Hapur. Other types of bins will be taken up as and when developed by other organizations.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1. SCOPE

**1.1** This standard ( Part I ) prescribes requirements regarding materials, dimensions and methods of construction of indoor steel bins, *GHARELU KOTHI* type, for domestic storage of whole foodgrains.

## 2. TERMINOLOGY

**2.1** For the purpose of this standard, the definitions given in IS : 5606-1970† and IS : 6151 ( Part I )-1971‡ shall apply.

---

*Rules for rounding off numerical values ( *revised* ).

†Specification for steel bins for grain storage.

‡Storage management code: Part I Terminology.

## 3. VOLUMES AND DIMENSIONS

**3.1** The volumes and dimensions for bins shall be as given in Table 1 and Table 2. The approximate capacities of paddy, maize and wheat are also given in Table 2 for information.

**3.2** The details of typical bins are given in Fig. 1 for guidance only.

### TABLE 1 DIMENSIONS OF STEEL BINS

| SL No. | SIZE DESIGNATION | VOLUME OF THE BIN | HEIGHT | DIAMETER |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| | | mm$^3$ | mm | mm |
| i) | 1 | 0·42 | 900 | 769 |
| ii) | 2 | 0·68 | 990 | 938 |
| iii) | 3 | 0·82 | 1 785 | 769 |
| iv) | 4 | 1·35 | 1 950 | 938 |

NOTE — These sizes have been worked out taking into consideration the available sizes of sheets and minimum of wastage.

### TABLE 2 VOLUMES AND CAPACITIES OF STEEL BINS

| SL No. | SIZE DESIGNATION | VOLUME | PADDY* | | MAIZE† | | WHEAT‡ | |
|---|---|---|---|---|---|---|---|---|
| | | | Approx Quantity | Bags§ | Approx Quantity | Bags‖ | Approx Quantity | Bags¶ |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | | m$^3$ | kg | | kg | | kg | |
| i) | 1 | 0·42 | 230 | 3 | 298 | 3·3 | 315 | 3·3 |
| ii) | 2 | 0·68 | 374 | 5 | 483 | 5·4 | 510 | 5·4 |
| iii) | 3 | 0·82 | 451 | 6 | 582 | 6·5 | 615 | 6·5 |
| iv) | 4 | 1·35 | 743 | 10 | 959 | 10·7 | 1 013 | 10·7 |

*At the rate of 550 kg/m$^3$.

†At the rate of 710 kg/m$^3$.

‡At the rate of 750 kg/m$^3$.

§At the rate of 75 kg/bag.

‖At the rate of 90 kg/bag.

¶At the rate of 95 kg/bag.

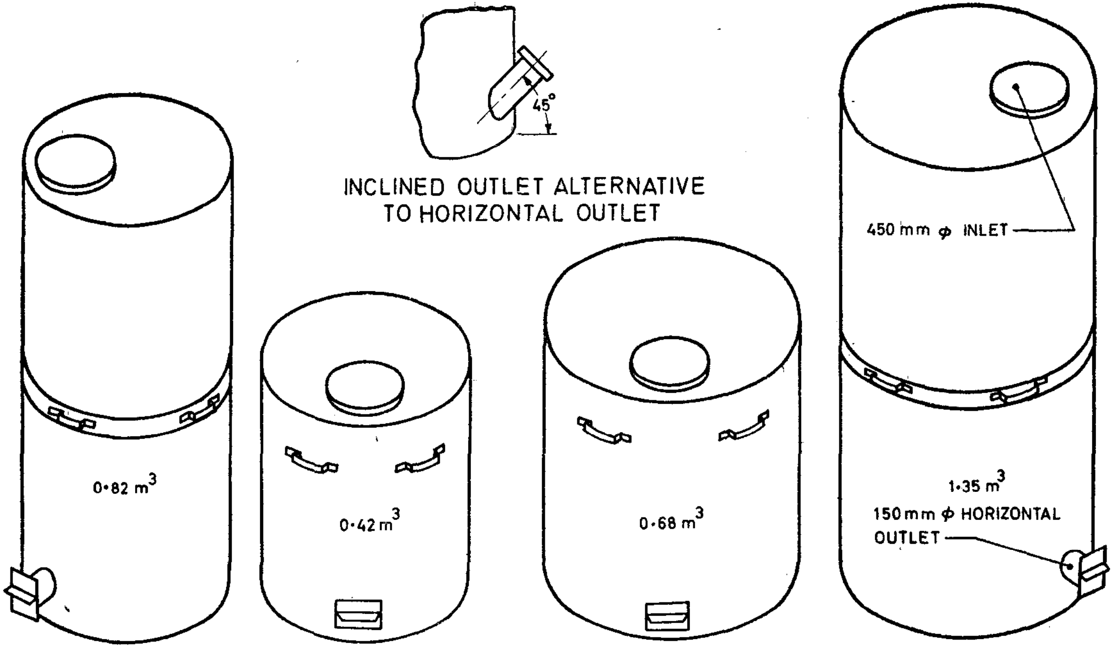

45°
INCLINED OUTLET ALTERNATIVE TO HORIZONTAL OUTLET
0·82 $m^3$
0·42 $m^3$
0·68 $m^3$
450 mm φ INLET
1·35 $m^3$
150 mm φ HORIZONTAL OUTLET

FIG. 1 DETAILS OF *GHARELU KOTHI*

## 4. MATERIAL OF CONSTRUCTION

**4.1** The bins shall be constructed from the following materials:

a) *Wall, Top and Bottom Plates, Inlet and Outlet* — galvanized plain steel sheets conforming to **2** of IS : 277-1969*

b) *Inner Ring* — mild steel flats conforming to **2** of IS : 1731-1971†

c) *Clips and Clasps* — galvanized plain steel conforming to **2** of IS : 277-1969*

**4.2 Size of Sheets** — The sheets of the sizes 2·5 × 0·90 m shall be used for construction of the main body of the bins.

**4.3 Thickness of Steel Sheets** — The thickness of the sheets used for wall, top and bottom plates, inlet and outlets shall be 0·63 mm. The thickness of sheets used for clasp rings shall be 1·0 mm and those used for clasps shall be 1·60 mm.

## 5. CONSTRUCTIONAL REQUIREMENTS

**5.1 Steel Sheets** — The steel sheets used for construction of the bins shall be free of scratches, gauge marks, water marks or any signs of lifting of the coating. The edges shall be straight. The corners shall be at 90°.

**5.2 Corrosion Resistance** — All mild steel parts shall be thoroughly cleaned of scale, welding slag and oil stains. The steel shall be painted with one coat of non-lead base metal primer, such as iron and zinc chromate primer, followed by two coats of synthetic enamel, exterior, before assembly.

**5.3** While constructing the bin, lines for folding and cutting the sheet should first be set out. The sheet in opposite direction should be bent at the two ends along the set out lines after cutting top corners of the sheet. The two folded ends should be joined and hammered to make a close joint and then drilled and riveted at 150 mm pitch ( *see* IS : 2155-1962‡ ). The details of riveting are given in Fig. 2. Care should be taken that the tongues of joints are well sealed otherwise, the diameter may be affected. The end of the bin wall should be flanged in beading machines.

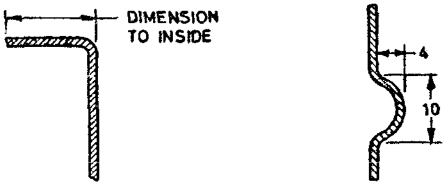
**5.4 Assembly** — The lower end of the top wall section should be slipped over the top end of the bottom wall section, so that the grooves provided in the top wall section come into contact with stiffening ring. The clasping ring should be fixed with grooves covering the overlap joint and lying in the grooves in the bin walls; with deeper groove to bottom. The clasping bolt of the correct size and length should be fixed with metal washers at both ends tightened, the edges of the clasping ring should be tipped over if these tend to stand above the bin wall.

---

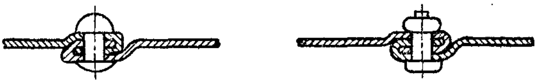
*Specification for galvanized steel sheets ( plain and corrugated ) ( *second revision* ).

†Dimensions for steel flats for structural and general engineering purposes ( *first revision* ).

‡Specification for rivets for general purposes ( below 12 mm diameter ).



BIN WALL LIP BIN WALL BENDING



SOLID RIVETS BREAK AWAY RIVETS ALTERNATIVE RIVETING

All dimensions in millimetres.

FIG. 2 DETAILS OF RIVETING

**5.5** The bins with volumes of 0·82 m$^3$ and 1·35 m$^3$ shall be jointed at centre with a clasp ring while those with volume of 0·42 m$^3$ and 0·68 m$^3$ shall be considered as being half of the above bins with a base added.

## 6. FITTINGS AND ACCESSORIES

**6.1 Inlet** — A circular inlet of 225 mm diameter or 450 mm diameter shall be fitted to the top plate.

**6.2 Outlet** — A horizontal or inclined outlet of 150 mm diameter shall be fitted in the wall panel at the base.

**6.3 Inlet and Outlet Lids** — The inlet and outlet lids shall be constructed with two clasps, diagonally opposite each other at specified position so that the lids fit neatly and may be locked in position.

**6.4 Clasps** — The clasps of appropriate size shall be fixed by riveting at the two ends of clasping strip at the desired position.

## 7. WORKMANSHIP AND FINISH

**7.1** The bins shall be manufactured with dimensional accuracy and should be finished properly.

**7.2** The inlet and outlet lids shall fit in neatly and shall be capable of locking in position by clasps.

**7.3** All the metal parts shall be suitably primed and painted.

**7.4** All the screws and bolts shall be tight.

**7.5** The soldering of outlets and inlets shall be proper. The surfaces shall be washed free of acids. No black stains shall be present.

## 8. SUPPLY CONDITIONS

**8.1** The storage bins shall be supplied prefabricated.

**8.2** The suppliers of the bins shall furnish a copy of the instructions on installation and maintenance for users before delivery of the bins.

**8.3** The buyers should also check the bins for the details given in Appendix A before purchase.

## 9. MARKING

**9.1** A metal label giving the name of the supplier, the batch and serial number, size designation of the bin shall be attached to the bin. Alternatively, these details may be stencilled on the bin.

**9.1.1** Each bin may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

# APPENDIX A

( *Clause* 8.3 )

## DETAILS TO BE CHECKED BY A BUYER

## A-1. DETAILS

**A-1.1** Check that the inlet lid fits neatly and that clasps will lock the lid in position.

**A-1.2** Check that inlet and outlet padlocks are supplied.

**A-1.3** Check that outlet cover fits neatly and that provision is made for locking.

**A-1.4** Check that all metal parts have been painted, scrape a little of the enamel to check that the metal has also been primed ( underneath colour should be brownish red ). Check that metal parts have been painted before assembly.

**A-1.5** Check that all screws and bolts are tight.

**A-1.6** Check soldering of outlets and inlets and ensure that surface has been well washed to remove acids. No black staining should be present.

**A-1.7** Check that all steel rivets have been touched up with paint after assembly.

**A-1.8** Check that all joints are flat and smooth and have not been damaged, buckled or bent.

**A-1.9** Check that an instruction sheet has been attached and that it is in a language understood by the purchaser and that he understands the meaning.

**A-1.10** Check that capacity and name have been stencilled on the side wall.

**A-1.11** Check that manufacturer has given maintenance instructions.

**A-1.12** Check the overall dimensions of the bin and the cubic capacity as stencilled on the bin is correct.

( *Continued from page* 2 )

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